COURSE SYLLABUS – MATH 3339
Statistics for the Sciences

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YEAR COURSE OFFERED: 2023

SEMESTER COURSE OFFERED: Spring 2023

DEPARTMENT: MATH

COURSE NUMBER: 3339 – 13281

NAME OF COURSE: Statistics for the Sciences

NAME OF INSTRUCTOR: Dr. Wenshuang Wang

Format: Face to Face

Course Webpage: www.casa.uh.edu

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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.
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Email Policy

In order to make sure I see class related emails, I require that students include "MATH 3339 Section 13281" as well as a searchable description of the issue in the subject line for ALL course-related email correspondence. If you do not receive a timely response to an important email, it is your responsibility to send a follow-up email. If I do not respond to your email within two working days, please resend the email. If you again do not hear from me within one more working day, it is likely that your email is not coming through and you should come to office hours or speak with me before or after class. It is your responsibility to ensure that I am aware of issues you may have with the course; failure to effectively initiate timely communication is not a valid basis for a grade grievance and cannot be used as such.

Technology Requirement

Computer and internet access is required for this course. Students will need:

- a functioning (updated) computer
- reliable Internet connection
- PDF viewer/Ability to watch mp4 files
- ability to log in to CASA for online assignments
- ability to access Microsoft TEAMS platform

Note that all UH students have access to MS teams with their cougarnet ID.

Course Description

- Graphical and descriptive methods in statistics, probability, random variables and distributions,

sampling, estimation, hypothesis testing, regression, analysis of variance, exploratory and diagnostics, statistical computing.

- Credits: 3 hours
- Prerequisite: MATH 1432
- Textbook: Available in electronic form (PDF) through CASA for all enrolled students.

Learning Objectives

The student will be able to:

- Demonstrate the ability to understand basic theory of probability and statistics.
- Understand fundamentals of probability, distribution theory and sampling models.
- Interpret statistical data.
- Understand statistical inference and interpretation.
- Apply statistical concepts to actual scientific data using some sort of computer software.

Instructor Information

- Instructor: Dr. Wenshuang Wang
- Office: Fleming 11D
- Office Hours: MW 9:30 am - 10:30 am
- Email: wwang51@uh.edu or wwang60@central.uh.edu

Major Assignments/Exams

ASSESSMENTS

Participation	5%
Online Quizzes	15%
Homework	10%
Exams (2 exams)	40% (20% each)
Final Exam	30%

Note: The percentage grade on the final exam can be used to replace your lowest test score.

GRADING SCALE

93% and above - A	at least 90% and below 93%- A-
at least 87% and below 90% - B+	at least 83% and below 87% - B
at least 80% and below 83% - B-	at least 77% and below 80% - C+
at least 73% and below 77% - C	at least 70% and below 73% - C-
at least 67% and below 70% - D+	at least 63% and below 67% - D
at least 60% and below 63% - D-	below 60% - F

INSTRUCTIONS FOR PARTICIPATION (POPPERS)

- For each lecture, you will have poppers which are short questions that will have to do with each lecture.
- Popper due dates and times can be seen under EMCF tab at CASA courseware.
- The total number of questions for the course will be counted, 85% of the total number of questions will be the used for full credit. For example, if there are 5 questions each class for 24 classes, which is 120

questions. Your grade will be calculated out of 120(.85) = 96 points, with 96 points as the maximum value.

INSTRUCTIONS FOR QUIZZES

- The quizzes are located in the CASA courseware course website under the "Online Assignments" tab.
- The quizzes will close on the due dates given at 11:59 pm.
- You have 10 times to take each quiz.
- There is a 90 minute time limit for each quiz.
- One of the lowest quizzes will be dropped.
- The following table shows tentative schedule and what sections each quiz covers.

Quiz	**Topics Covered**	**Textbook Sections**	**Date Closed**
Quiz 1	Counting Techniques and Introduction to Probability	3.1 – 3.3	January 28
Quiz 2	Probability Rules, Independence and Bayes Rule	3.4 – 3.7	February 4
Quiz 3	Distributions and Descriptive Statistics	2.1 – 2.4	February 11
Quiz 4	Bivariate Descriptive Statistics	2.6 & 9.1 – 9.2	February 18
Quiz 5	Discrete Distributions	4.1 – 4.6	February 25
Quiz 6	Binomial, Hypergeometric, Poisson and Joint Distributions	4.4 – 4.9	March 4
Quiz 7	Continuous Distributions	5.1 – 5.4	March 11
Quiz 8	Uniform, Exponential, Normal & Sampling Distributions	5.3 – 6.9	March 25
Quiz 9	Confidence Intervals	7.1 – 7.6	April 1
Quiz 10	Hypothesis Tests	8.1 – 8.5	April 8
Quiz 11	Inferences on Two Groups or Populations	10.1 – 10.5	April 15
Quiz 12	Inference on Regression Parameters	9.1 – 9.4	April 22
Quiz 13	ANOVA and Chi-square Tests	11.1 – 12.3	April 29

INSTRUCTIONS FOR HOMEWORK

- See the tentative schedule below.
- Each homework assignment is worth 15 points.
- You will submit the homework in the CASA Courseware website. See Instructions to upload homework in CASA for how to upload the homework.
- Homework will NOT be accepted by emails.
- Working with other students on the assignments is highly recommended. However, each student's homework must present their original work. Otherwise this will affect your grade.
- One of the lowest homework scores will be dropped.

Assignment	Topics Covered	Textbook Sections	Due Closed
Homework 1	Probability	3.1 – 3.7	February 4
Homework 2	Distributions and Descriptive Statistics	2.1 – 2.6 & 9.1 – 9.2	February 18
Homework 3	Discrete Distributions	4.1 – 4.9	March 1 (Wednesday)
Homework 4	Continuous Distributions	5.1 – 6.7	March 25
Homework 5	Introduction to Confidence Intervals and	7.1 – 8.5	April 8

	Hypothesis Tests		
Homework 6	Inferences on Two Groups and Proportions, Inference for Regression Parameters and Correlation	10.1-10.5; 9.1-9.4	April 19 (Wednesday)
Homework 7	ANOVA and Chi-square Tests	11. 1 – 12.3	April 29

LATE ASSIGNMENT, MAKE-UP AND INCOMPLETE POLICIES

- This course is a cumulative course. You as a student need to keep up with the reading, homework assignments, quizzes, and exams.
- The following is calculated for the final grade:
  - One of the lowest quizzes will be dropped.
  - One of the lowest homework assignments will be dropped.
  - The final exam score can replace the lowest exam scores.
- Incomplete policy: A notation of "incomplete" may be given in lieu of a final grade to a student who has carried a subject successfully until the end of a semester but who, because of illness or other unusual and substantiated cause beyond the student's control, has been unable to take or complete the final examination or to complete some limited amount of term work.

Exam Information

MIDTERM EXAMS

Test 1: Textbook Sections Covered: 1.1 - 4.9, & 9.1 – 9.2; March 2-4

Test 2: Textbook Sections Covered: 5.1 – 8.5, & 10.1-10.5; April 20-22

- The test will be given in CASA located on the second floor of Garrison, Agnes Hall or CBB, see the exam scheduler for details.
- You can access the scheduler for these exams by logging into Courseware.
- The test will consist of both multiple choice and written questions.
- The multiple-choice questions will be machine graded.
- The written questions (free response) will be graded by the teaching assistants.
- There will be a practice test on Courseware for each exam. The due date for practice tests is the day before the exam period begins. You can receive 5% of your practice test grades as bonus points towards the exam.
- The scheduler will be available approximately 2 weeks prior to the start of the exam cycle. Exam dates are listed above.

FINAL EXAM

- Final exam will be comprehensive and mandatory for ALL students.
- Final exam will be given in CASA located on the second floor of Garrison, Agnes Hall or CBB, see the exam scheduler for details.
- Dates: **May 9-11**

Required Reading

- The textbook, online quizzes, and additional help materials will be made available by logging into Courseware at http://www.casa.uh.edu . Students pay for access to CASA as part of their fee bill via CTAP.
- If one opts out of the CTAP, they can purchase the code at UH Bookstore. In this case, if the code is not entered by the deadline given on CASA, students will lose access to CASA. No make ups will be given for assignments missed during the no-access period.

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- More information on the Cougar Textbook Access Program (CTAP):
  https://uh.edu/af-auxiliary-services/ctap/
  https://uh.edu/af-auxiliary-services/ctap/ctap-faqs/

List of discussion/lecture topics

- This table is tentative and may need to be updated during the semester. Updates will be announced in lecture and posted on the course website.

Week	Textbook Sections	Topics
Week 1	Chapter 1, 3.1 – 3.3	Sample, Population, Types of Variables, Types of Experiments, Introduction to Probability, Sample Spaces, Counting Rules
Week 2	3.4 – 3.7	Probability Rules, Independence, Bayes' Theorem
Week 3	2.1 – 2.4	Univariate Descriptive Statistics (Central Tendency, Spread, Percentiles and Quantiles, Histograms, Boxplots, Stem-and-Leaf)
Week 4	2.5 – 2.6 & 9.1 – 9.2	Bivariate Descriptive Statistics (Scatterplot, Covariance, Correlation, Least Squares Regression)
Week 5	4.1 – 4.6	Discrete Probabilities, Expected Values, Binomial Distribution
Week 6	4.7 – 4.9	Discrete Probabilities; Hypergeometric, Poisson, Jointly distributed
Test 1	1.1 – 4.9 & 9.1 – 9.2	
Week 7	5.1 – 5.5	Continuous Distributions, Uniform, Exponential, Gamma, Normal
Week 8	6.4 – 6.6	Sampling Distributions
Week 9	7.1 – 7.6	Introduction to Confidence Intervals
Week 10	8.1 – 8.5	Introduction to Hypothesis Tests
Week 11	10.1 – 10.5	Inference for Two Groups or Populations
Week 12	9.3 – 9.4	Inference for Regression Parameters and Correlation
Test 2	5.1 – 8.5; 10.1-10.5	
Week 13	11.1 – 12.2	Analysis of Variance & Chi-square Test for Goodness of Fit
Week 14	12.3	Chis-square Test of Independence
Final	Cumulative	

Computer Requirement

- Knowledge of a statistical package is an indispensable part of the modern statistics. The class presentations, some homework assignments, and the exams are computer based.
- The statistical package R-studio is used in this class for exploring statistical concepts and demonstrating statistical analysis of actual data useful for business decisions. No previous knowledge of this software is assumed.
- This software is a free package that you can download on to your personal computer. This will be available to you for your exams in CASA.
- You first need to download R: https://www.r-project.org/
- Then you can download Rstudio: https://www.rstudio.com/

COVID-19 Information

Students are encouraged to visit the University's COVID-19 website for important information including diagnosis and symptom protocols, testing, vaccine information, and post-exposure guidance. Please check the

website throughout the semester for updates. Consult the (select: Undergraduate Excused Absence Policy or Graduate Excused Absence Policy) for information regarding excused absences due to medical reasons.

Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact the Justin Dart Jr. Student Accessibility Center (formerly the Justin Dart, Jr. Center for Students with DisABILITIES).

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Syllabus Changes

Please note that the instructor may need to make modifications to the course syllabus. Notice of such changes will be announced as quickly as possible through our CASA course page and UH email.

Resources for Online Learning

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our Power-On website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Blackboard; requesting a laptop through the Laptop Loaner Program; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

UH Email

Please check and use your Cougarnet email for communications related to this course. To access this

email, login to your Microsoft 365 account with your Cougarnet credentials.

Academic Honesty Policy

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/.

Helpful Information

Coogs Care: https://uh.edu/dsa/coogscare/

Student Health Center: https://www.uh.edu/healthcenter/